

Abstract Title Page
Not included in page count.

Title: Can we improve preschool classroom quality in Chile? A cluster-randomized trial evaluation of a professional development program

Authors and Affiliations:

Diana Leyva
Davidson College
dileyva@davidson.edu

Hirokazu Yoshikawa
New York University
hiro.yoshikawa@nyu.edu

Catherine E. Snow
Harvard University
catherine_snow@gse.harvard.edu

Ernesto Treviño
Universidad Diego Portales

Andrea Rolla
Ministry of Education of Chile

M. Clara Barata
University Institute of Lisbon

Christina Weiland
University of Michigan
weilandc@umich.edu

Abstract Body

Limit 4 pages single-spaced.

Background / Context:

Description of prior research and its intellectual context.

In recent years, governments across the world have increased their investments in early childhood education programs (Britto, Yoshikawa, & Boller, 2011; Engle et al., 2011; Myers, 2006; UNESCO, 2006). This investment in preprimary education reflects the proven value of providing early learning opportunities in promoting later educational attainment and earnings (Cunha & Heckman, 2006). While the initial focus for those interested in improving early childhood education in low and middle-income countries was access, the reform emphasis has progressively shifted to quality and equity, as overall access has improved in many nations. The intervention program *Un Buen Comienzo* (A Good Start) constitutes the first large-scale, randomized evaluation of an effort to improve the quality of preschool education in South America. *Un Buen Comienzo* (henceforth UBC) is an intensive two-year intervention that provides professional development program to prekindergarten and kindergarten teachers in Chile, with the goal of enhancing children's language, literacy, health and socio-emotional outcomes.

Purpose / Objective / Research Question / Focus of Study:

Description of the focus of the research.

Does an intensive, two-year teacher professional development program improve indicators of classroom quality and child language, literacy and socioemotional outcomes?

Setting:

Description of the research location.

As Chile and other nations expand their preprimary education systems, in particular, concerns persist about improving quality and maximizing the likelihood of facilitating children's early learning, later school success, and ultimate productivity as citizens. The quality of preschool classrooms in Chile, for example, may be inadequate (Herrera & Bellei, 2002; Eyzaguirre & Le Foulon, 2001). Strasser and colleagues (2009) conducted systematic observations in kindergarten classrooms in nine schools with diverse sources of funding serving children from different socioeconomic backgrounds in the metropolitan region of Santiago (Strasser, Lissi, & Silva, 2009). They found that non-instructional activities accounted for more than half of the time in these classrooms. Non-instructional activities included children eating snacks, teachers managing the children's behavior and recess time. Instructional activities typically focused on language and arts and crafts. Importantly, on average teachers spent only five minutes reading books with children and only one minute teaching the names and/or sounds of letters. Activities explicitly building vocabulary (e.g., discussing the meaning of words) were virtually nonexistent.

Population / Participants / Subjects:

Description of the participants in the study: who, how many, key features, or characteristics.

A total of 64 schools, 91 classrooms, 119 teachers, 94 aides and 1868 4-year-old children participated in the study. In the Full UBC condition, there were 32 schools, 53 classrooms, 66 teachers, 54 aides, and 1032 children (half girls, half boys). In the Comparison condition, there were 32 schools, 39 classrooms, 53 teachers, 40 aides and 836 children (half girls, half boys). Cohort 1 included one municipality and 6 schools; Cohort 2 included two municipalities and 29 schools; and Cohort 3 included three municipalities and 29 schools. All schools served primarily children from low-income households.

Intervention / Program / Practice:

Description of the intervention, program, or practice, including details of administration and duration.

The UBC program consists of twelve modules overall (six modules per year). Each module consisted of four weekly activities, beginning with a half-day didactic workshop to introduce a particular topic and the corresponding instructional strategies (e.g., supporting children's predictions in book read-alouds). This workshop was followed over the next two weeks of each module by two coaching sessions. During the first coaching session, the coach modeled for the teacher and aide the strategies introduced at the workshop. In the second session, the teacher and aide either implemented the strategies in the classroom and the coach observed, or teachers co-implemented the strategy with the coach. Every two months, a group reflection at the school took place to discuss the successes and challenges of the module's topic and strategies. Each coaching session consisted of: a) a brief meeting between the coach and the teacher and aide to plan and share the activity plan; b) the implementation of the activity plan in the classroom; and c) an immediate post-observation meeting to discuss what went well and what could be improved.

UBC modules addressed the domains of preschool quality identified as central by Chilean stakeholders, policy makers and educators:

1. *Oral language and early literacy development.* Teachers were trained on book-reading strategies, using extended discourse, and on developing vocabulary and emergent writing skills in children.
2. *Socio-emotional development.* Teachers were trained in behavior management strategies, establishing a positive classroom climate, and individual case management for children with challenging behaviors.
3. *Coordination of early childhood education with health services.* Teachers were equipped with specific skills and materials to address health problems affecting preschool-aged children in Chile, which include respiratory illnesses and lack of sufficient well-child visits (Ministerio de Salud, 2006; CDC Global School-Based Health Survey Chile, 2004).

Research Design:

Description of the research design.

We estimated the causal impact of the UBC program using a cluster-randomized design, with random assignment of schools to either the UBC intervention ("Full UBC" condition, which besides training provided roughly 100 books per classroom) or a much-reduced intervention ("Comparison" condition, which consisted of 10 books distributed per classroom and one workshop on self-care issues for teachers and aides). Schools were randomly assigned within municipality.

Data Collection and Analysis:

Description of the methods for collecting and analyzing data.

The evaluation of the UBC program involved three successive annual cohorts. Each cohort was assessed at three different time points: a) time 1: a pre-test at the beginning of the pre-kindergarten (4-year-old) year, previous to randomization; b) time 2: at the end of pre-kindergarten; and, c) time 3: at the end of kindergarten. The results presented here include data from times 1, 2, and 3, pooled across all three cohorts.

Classroom quality. To measure classroom quality, we used the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008), which focuses on interactions between students and teachers. The CLASS is measured on a seven-point scale with higher scores indicating higher quality. We used classroom video coding which is a standard procedure used by other studies; no differences have been found between classroom video coding and live coding (cf. Pianta et al., 2008).

Child outcomes. Children's language and early literacy skills were assessed using the Woodcock-Muñoz Language Survey Revised Spanish Form (WMLS-R; Woodcock, Muñoz-Sandoval, Ruef, & Alvarado, 2005). The Picture Vocabulary subtest was used to examine language skills, and the Letter-Word Identification, and Early Writing (Dictation) subtests were used to examine early literacy skills. Children's socioemotional skills were assessed using parents', teachers' and assessors' ratings on two domains: a) prosocial and positive behaviors, b) impulse control, attention shifting, and externalizing and internalizing behaviors (SSRS; Gresham & Elliott, 1990; EDI/DIT; Janus & Offord, 2007; TOCA-R; Werthamer-Larsson, Kellam, & Wheeler, 1991; CPPRG, 1990).

Analysis. To estimate program impacts on classroom quality in this cluster-randomized trial, we conducted multi-level models that accounted for the nesting of classrooms within schools in our study in calculating parameter estimates and standard errors. Our approach was consistent with the recent literature on cluster-randomized trials in educational evaluations (hierarchical linear models; Bloom et al., 2007; Hedges & Hedberg, 2007; Murnane & Willett, 2010; Raudenbush et al., 2007). To increase the precision of our impact estimates, we also included covariates that controlled for child and teacher characteristics.

Findings / Results:

Description of the main findings with specific details.

Classroom-level impacts. We found positive intervention effects for all three variables measuring prekindergarten classroom quality at the end of the first year of intervention (see Table 1). Intervention effects were positive and statistically significant for Emotional Support and Classroom Organization ($p < .05$) and positive and marginally significant for Instructional Support ($p < .10$). One effect size was in the large range – Full UBC classrooms scored 0.81 of a standard deviation higher than Comparison classrooms on Emotional Support. Effect sizes for Classroom Organization and Instructional Support were in the moderate range (0.45 and 0.43 respectively). As shown in Table 2, we also found positive intervention effects for two out of the three variables measuring kindergarten classroom quality at the end of the second year of intervention. Intervention effects were positive and statistically significant for both Emotional

Support and Classroom Organization ($p < .05$) but not for Instructional Support ($p > .10$). Their effect sizes were in the moderate range (0.37 and 0.43 respectively).

Child-level Impacts. Table 3 summarizes the results of the impact analyses on child outcomes (language, literacy, and socioemotional skills) at the post-test. There were no significant effects of the UBC program on children's language, literacy or socioemotional skills at the end of kindergarten.

Conclusions:

Description of conclusions, recommendations, and limitations based on findings.

We expected that improvement in classroom practices – the initial and proximal target for intervention – would be apparent after one and after two school years of support provided by UBC. We found evidence, in fact, that observed classroom practices, measured through the CLASS assessment, improved as a result of the intervention. In addition, this study provides useful data on classroom quality under usual conditions in government-funded pre-kindergarten and kindergarten classrooms in urban Chile. Examination of the comparison-group means suggests relatively minimal levels of quality on each of the three dimensions. These results are overall in accord with prior studies of the quality of preschool education in Chile using measures like the ECERS (Strasser & Lissi, 2009; Villalón et al., 2002), and provide new evidence for the urgency of efforts to improve classroom quality.

Notably, the UBC program did not have a significant effect on children's language, literacy and socioemotional skills at the end of the two-year program. This is surprising given that the classroom practices for which we find evidence of impact are features of observed classroom quality that have been linked to improvements in children's socio-emotional and cognitive outcomes, over time (Burchinal et al., 2008; Howes et al., 2008 Mashburn et al., 2008). Recent studies show, however, that the association between classroom quality and child outcomes may depend on the duration of classroom experience at particular levels of quality that have been experienced, and may be modest in magnitude (Burchinal et al., 2010; Burchinal, Kainz & Cai, 2011). It is possible that more time was needed (this was a two-year program) in order for the positive effects of UBC at the classroom level to trickle down to the child level.

Our findings suggest that the impact of preschool education on classroom quality in Chile can be improved by incorporating research-based teaching practices and strategies focused on enhancing language and literacy, health as well as behavior management and family involvement into existing classroom practices and curricula. They also suggest that simply providing some books to teachers and aides and offering a workshop (the Comparison-condition intervention) is not sufficient to make a positive and significant impact on pre-kindergarten classroom quality in Chile. Teachers and aides in the Comparison condition did not improve the quality of their interactions with children during the pre-kindergarten year to the degree that teachers and aides in the UBC program did. In the UBC program, teachers and aides not only learned and practiced strategies to enhance children's learning experiences, but more importantly were continuously supported by coaches in improving their practices in the classroom. This professional development model with intensive coaching is relatively rare in teacher professional development programs in Chile and other Latin American countries; paired with an emphasis on content expertise, as was done in UBC, such models have shown promising results in North America (Aiken & Akers, 2011; Zaslow et al., 2010).

Appendices

Not included in page count.

Appendix A. References

References are to be in APA version 6 format.

- Aikens, N., & Akers, L. (2011). *Background review of existing literature on coaching*. Princeton, NJ: Mathematica Policy Research, Inc.
- Bloom, H., Richburg-Hayes, L., & Black, A.R. (2007). Using covariates to improve precision for studies that randomize schools to evaluate educational interventions. *Educational Evaluation and Policy Analysis*, 29(1), 30-59.
- Britto, P., Yoshikawa, H., & Boller, K. (2011). Quality of early childhood development programs and policies in global contexts: Rationale for investment, conceptual framework and implications for equity. *Social Policy Reports of the Society for Research in Child Development*, 25(2), 1-31.
- Burchinal, M., Howes, C., Pianta, R., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Predicting child outcomes at the end of kindergarten from the quality of pre-kindergarten teacher-child interactions and instruction. *Applied Developmental Science*, 12, 140-153.
- Burchinal, M., Vandergrift, N., Pianta, R., & Mashburn, A. (2010). Threshold analysis of association between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly*, 25(2), 166-176.
- Burchinal, M., Kainz, K., & Cai, Y. (2011). How well do our measures of quality predict child outcomes? A meta-analysis and coordinated analysis of data from large-scale studies of early childhood settings. In M. Zaslow, I. Martinez-Beck, K. Tout & T. Halle (Eds.), *Quality measurement in early childhood settings* (pp. 11-31). Baltimore, MD: Paul H. Brookes Publishing Co.
- Centers for Disease Control Global School-Based Health Survey Chile (2004). Atlanta, GA: U.S. Centers for Disease Control.
- Conduct Problems Prevention Research Group (CPPRG). (1990). *Social Competence Scale (Teacher Version)*. Available from the Fast Track Project Web site: <http://www.fasttrackproject.org>
- Cunha, F., & Heckman, J. (2006). The technology of skill formation. *American Economic Review*, 97, 31-47.
- Engle, P.L., Fernald, L. C., Alderman, H., Behrman, J., O’Gara, C., Yousafzai, A., de Mello, M. C., Hidrobo, M., Ulkuer, N., Ertem, I., Iltus, S., & The Global Child Development Steering Group (2011). Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *The Lancet*, 378, 1339-1353.
- Eyzaguirre, B., & Le Foulon, C. (2001). La calidad de la educación chilena en cifras. *Estudios Públicos*, 84 (primavera), 85-204.
- Gresham, F. M., & Elliott, S. N. (1990). *Social Skills Rating System*. Circle Pines, MN: American Guidance Service.
- Hedges, L.V., & Hedberg, E.C. (2007). Intraclass correlation values for planning group-randomized trials in education. *Educational Evaluation and Policy Analysis*, 29(1), 60-87.

- Herrera, M.O., & Bellei, Y.C. (2002). *¿Qué se sabe sobre la calidad de la educación parvularia chilena?* Santiago de Chile: Universidad de Concepción and UNICEF.
- Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Ready to learn? Children's pre-academic achievement in pre-Kindergarten programs. *Early Childhood Research Quarterly*, 23(1), 27-50.
- Janus, M., & Offord, D., (2007). Psychometric properties of the Early Development Instrument (EDI): A teacher-completed measure of children's readiness to learn at school entry. *Canadian Journal of Behavioural Science*, 39(1), 1-22.
- Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O., Bryant, D., Burchinal, M., et al. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*, 79, 732-749.
- Ministerio de Salud (2006). *Encuesta: Calidad de Vida*. Santiago de Chile: Author.
- Murnane, R., & Willett, J. (2010). *Methods matter: Improving causal inference in educational research*. Oxford University Press.
- Myers, R.G. (2006). *Quality in Programs of Early Childhood Care and Education*. Background paper prepared for Education for All Global Monitoring Report 2007. Starting Strong: Early Childhood Care and Education.
- Pianta, R. C., La Paro, K. M., & Hamre, B. K. (2008). *The Classroom Assessment Manual, pre-K*. Baltimore, MD: Brookes.
- Raudenbush, S.W., Martinez, A., & Spybrook J. (2007). Strategies for improving precision in group-randomized experiments. *Educational Evaluation and Policy Analysis*, 29, 5-29.
- Strasser, K., & Lissi, M.R. (2009). Home and instruction effects on emergent literacy in a sample of Chilean Kindergarten children. *Scientific Studies of Reading*, 13, 175-204.
- Strasser, K., Lissi, M. R., & Silva, M. (2009). Gestión del tiempo en 12 salas Chilenas de kindergarten: Recreo, colación y algo de instrucción. *Psykhé*, 18, 85-96.
- United Nations Educational, Scientific and Cultural Organization UNESCO. (2006). *Education for All: Strong Foundations Early Childhood Care and Education*. EFA Global Monitoring Report 2007. Paris: UNESCO.
- Villalón, M. Suzuki, E., Herrera, M.O., & Mathiesen, M.E. (2002). Quality of Chilean early education from an international perspective. *International Journal of Early Years Education*, 10, 49-59.
- Werthamer-Larsson, L., Kellam, S., & Wheeler, L. (1991). Effect of first-grade classroom environment on shy behavior, aggressive behavior, and concentration problems. *American Journal of Community Psychology*, 19(4), 585-602.
- Woodcock, R. W., Muñoz-Sandoval, A. F., Ruef, M., & Alvarado, C. G. (2005). Woodcock Muñoz Language Survey – Revised. Itasca, IL: Riverside Publishing.
- Zaslow, M.J., Tout, K., Halle, T., Whittaker, J.V., & Lavelle, B. (2010). *Toward the identification of features of effective professional development for early childhood educators*. Washington, DC: U.S. Department of Education

Appendix B. Tables and Figures

Not included in page count.

Table 1. Impact of the first year of the UBC intervention on prekindergarten classroom quality outcomes

Classroom quality outcome	N	Adj. Mean	Adj. Mean	Diff.	Sig.	Effect
		Full UBC	Comparison			Size
		Group	Group			
Emotional support	76	4.810	4.42	0.390	***	0.814
Instructional support	76	1.804	1.605	0.199	~	0.438
Classroom organization	76	4.435	4.131	0.304	*	0.459

Table 2. Impact of the second year of the UBC intervention on kindergarten classroom quality outcomes

Classroom quality	N	Adj. Mean	Adj. Mean	Diff	Sig.	Effect
Outcome		Full UBC	Comparison			Size
		Group	Group			
Emotional Support	72	4.831	4.566	0.265	*	0.376
Instructional Support	72	1.842	1.813	0.029		0.056
Classroom Organization	72	4.340	3.990	0.341	*	0.432

Table 3. Impact of the UBC intervention on child outcomes after two years

Child Outcome	N	Adj. Mean	Adj. Mean	Diff	Sig.	Effect
		Full UBC	Comparison			Size
		Group	Group			
<u>Language and early literacy</u>						
<u>skills</u>						
Vocabulary	1409	26.909	26.553	-0.356		-0.07
Letter-word identification	1344	12.681	13.241	0.560		0.09
Early writing	1311	9.987	9.928	-0.059		-0.03
<u>Socioemotional skills</u>						
Prosocial and positive	1436	3.921	3.883	0.038		0.079
behaviors						
Impulse control, attention	1078	4.002	3.909	0.093	~	0.161
shifting, and externalizing						
and internalizing behaviors						